



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,867	08/21/2003	Toshiaki Asada	116176	7049
25944	7590	08/25/2004	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			RIDDLE, KYLE M	
			ART UNIT	PAPER NUMBER
			3748	

DATE MAILED: 08/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/644,867	Applicant(s) ASADA, TOSHIKI	
	Examiner Kyle M. Riddle	Art Unit 3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 August 2003 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>08212003</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 5 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Dong (U.S. Patent 6,321,715).

Dong discloses a stratified exhaust gas recirculation system comprising:

- an intake valve actuator 25 and exhaust valve actuator 26 that varies the lift and timing of the intake valve 20 and exhaust valve 24, respectively (column 7, lines 66-67 with column 8, line 1);
- an electronic controller 30 receiving a variety of inputs from engine operating sensors 32 to include engine speed, engine load, air-fuel ratio, intake manifold absolute pressure, exhaust manifold absolute pressure, engine temperature, engine exhaust temperature, and other parameters to control valve actuators 25, 26 (column 7, lines 42-65);
- controlling the exhaust valve actuator 26 to operate the exhaust valve 24 to induce varied levels of exhaust gas residuals from the exhaust port 22 into the combustion chamber 19 to reduce pumping losses depending on engine operating conditions (column 9, lines 56-63);
- improving engine efficiency and reduced emissions by introducing the stratified mixture through the exhaust port 22 (column 11, lines 60-67);

Art Unit: 3748

- using a conventional three-way catalyst for emission control (column 14, lines 11-13).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4, 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dong in view of Reitz et al. (U.S. Patent 6,736,106).

Dong discloses a stratified exhaust gas recirculation system comprising an intake valve actuator and exhaust valve actuator that varies the lift and timing of the intake valve and exhaust valve, an electronic controller receiving a variety of inputs from engine operating sensors to include engine speed, engine load, air-fuel ratio, intake manifold absolute pressure, exhaust manifold absolute pressure, engine temperature, engine exhaust temperature, and other parameters to control valve actuators, controlling the exhaust valve actuator to operate the exhaust valve to induce varied levels of exhaust gas residuals from the exhaust port into the combustion chamber to reduce pumping losses depending on engine operating conditions, improving engine efficiency and reduced emissions by introducing the stratified mixture through the exhaust port, using a conventional three-way catalyst for emission control. Dong, however, fails to disclose increasing the compression ratio by opening and closing the exhaust valve after the intake valve closes.

Reitz et al. teach a valve actuation system using variable valve actuators that briefly open the intake valve 110 or exhaust valve 114 to allow pressurized gases into their respective

Art Unit: 3748

manifolds for later readmission into the combustion chamber during a combustion cycle to include the latter half of the compression stroke (after intake valve closure) based on operating conditions (column 5, lines 3-6, lines 15-20, column 6, lines 15-17, lines 48-58, column 7, lines 18-21). It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the teaching by Reitz et al. in the valve train system of Dong, since the use thereof would have provided additional opening and closing times for improving fuel consumption and emission control.

Conclusion

5. The IDS (PTO-1449) filed on 21 August 2003 has been considered. An initialized copy is attached hereto.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and consists of 3 patents.

- Nohira et al. (U.S. Patent 4,442,809) disclose a combustion chamber with an operating valve and accumulation chamber for re-introducing exhaust gases after the intake valve closes.

- Xu (U.S. Patent 6,318,348) discloses a stratified exhaust gas recirculation strategy using vortex shaped intake and exhaust valve passages.

- Urushihara et al. (U.S. Patent 6,386,177) disclose a system for stratified ignition of gases in an internal combustion engine.

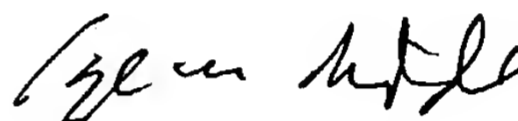
Communication

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kyle M. Riddle whose telephone number is (703) 306-3409. The examiner can normally be reached on M-F (07:30-5:00) Second Friday Off.

Art Unit: 3748

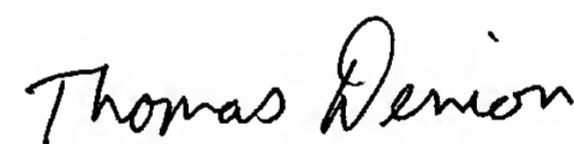
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (703) 308-2623. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kyle M. Riddle
Examiner
Art Unit 3748

kmr



THOMAS DENION
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700